

### **REMARKS**

Claim 7 is amended herein. Support for the amendment is found in the specification, for example, at paragraphs [0058]-[0062] and the Figures. No new matter is added by the amendments.

New Claims 14 and 15 are added herein. Support for new Claim 14 is found in the specification, for example, at paragraph [0028]. Support for new Claim 15 is found in the specification, for example, in the Examples, Comparative Examples and Figures, and paragraphs [0058]-[0062]. No new matter is added by the new claims.

Upon entry of the amendment, Claims 1, 2, 5, 7-10, 12, 14 and 15 are pending.

#### **Rejection of Claim 7 under 35 U.S.C. § 112, second paragraph**

The Office Action rejects Claim 7 as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention. In particular, the Office Action states that the term “irregularly” is unclear in scope.

Without acquiescing to the rejection, but in order to expedite prosecution, Applicant has amended Claim 7 to replace the objected-to term with the term “non-uniformly.” Applicants submit that Claim 7, as amended, is clear and definite. Withdrawal of the rejection is respectfully requested.

#### **Rejection of Claims 1, 2, 7, 9, 10 and 12 under 35 U.S.C. § 102(b) over Minegishi**

The Office Action rejects Claims 1, 2, 7, 9, 10 and 12 under 35 U.S.C. § 102(b) as being anticipated by Minegishi (US Pub. No. 2003/0094409). In particular, the Office Action states that Minegishi discloses the steps of dissolving poly(vinylidene fluoride)-based resin and then cooling.

Minegishi does not anticipate the claims because Minegishi does not disclose all elements of Claim 1 or claims dependent therefrom. In particular, Minegishi does not disclose an organized clay or a hydrophilic compound.

Minegishi is directed to a hollow fiber membrane and method of producing the same. *Minegishi* at Title. Minegishi discloses discharging a polyvinylidene fluoride solution comprising a polyvinylidene fluoride resin and a poor solvent at a temperature above a phase

**Application No.:** 10/587,786  
**371(c) Date:** July 28, 2006

separation temperature into a cooling bath at a temperature below the phase separation temperature to coagulate the polyvinylidene fluoride resin. *Minegishi* at Abstract. However, Minegishi does not disclose an organized clay dispersed in liquid raw material. Further, Minegishi does not disclose an organized clay being organized by a hydrophilic compound. As such, Minegishi does not disclose all elements of Claim 1. Accordingly, Minegishi cannot anticipate Claim 1 or claims dependent therefrom.

The Office Action appears to acknowledge that Minegishi does not disclose these claim elements. For example, the Office Action states:

Minegishi et al. teach that additives such as inorganic salts can be added to the membrane, but *do not expressly teach that the salts are organized clay* such as inorganic silicates, said silicates of which are prepared using alkylene oxide or onium ions. *Office Action* at page 4 (emphasis added).

Thus, the Office Action states that Minegishi does not expressly disclose an organized clay. The Office Action does not state that Minegishi inherently discloses an organized clay. Accordingly, it appears that the Office Action acknowledge that Minegishi does not disclose an organized clay. As such, the Office Action appears to agree that Minegishi does not disclose all elements of Claim 1.

In view of the above, Applicants respectfully request removal of the anticipation rejection of Claim 1 and claims dependent therefrom.

#### **Rejection of Claims 5 and 8 under 35 U.S.C. § 103 over Minegishi and Ross**

The Office Action rejects Claims 5 and 8 under 35 U.S.C. § 103 as being obvious over Minegishi in view of Ross (US Pat. No. 6,521,690). In particular, the Office Action states that Minegishi teaches the recited dissolving and cooling steps, and Ross teaches a modified smectite clay.

Claims 5 and 8 are non-obvious over Minegishi and Ross, alone or combined, because Minegishi teaches away from Claim 1, from which Claims 5 and 8 depend, and because Minegishi teaches away from Ross.

Minegishi teaches the undesirability of using inorganic particles, and the invention of Minegishi avoids use of inorganic particles. In particular, Minegishi teaches:

The melt extraction process yields a relatively uniform, high-strength membrane with no macrovoids; however, poor dispersion of the inorganic particles can cause defects such as pinholes. Furthermore, the melt extraction process has a disadvantage of extremely high production cost. *Minegishi* at paragraph [0007].

Thus, Minegishi teaches the undesirability of methods that use inorganic particles because these methods result in “defects such as pinholes” and have “extremely high production cost.” Minegishi avoids the use of inorganic particles by discharging a polyvinylidene fluoride solution comprising a polyvinylidene fluoride resin and a poor solvent at a temperature above a phase separation temperature into a cooling bath at a temperature below the phase separation temperature to coagulate the polyvinylidene fluoride resin. *Minegishi* at paragraph [0010]. One of ordinary skill in the art would be led by the teachings of Minegishi to avoid use of inorganic particles in order to avoid the adverse consequences of using inorganic particles taught by Minegishi. Accordingly, one of ordinary skill in the art would be motivated by the teachings of Minegishi to avoid using an organized clay due to the adverse consequences taught by Minegishi. Therefore, the teachings of Minegishi would lead one of ordinary skill away from Applicants’ claimed method.

Furthermore, Minegishi teaches away from any combination with Ross. Ross teaches an organic chemical/smectite clay intercalate that has been ion-exchanged and reacted and intercalated with one or more quarternary ammonium compounds and an anionic material and further blended into a polymer resin to make a nanocomposite composition. *Ross* at Abstract. However, as provided above, Minegishi teaches avoiding methods that use inorganic particles because these methods result in adverse consequences. As such, Minegishi teaches avoiding materials such as Ross’ smectite clay. Accordingly, Minegishi teaches away from its combination with Ross. Therefore, Minegishi and Ross cannot be properly combined to render obvious Claim 1 or claims dependent therefrom.

Furthermore, the use of the clay in Ross is to reinforce a resin product and is not intended to form a membrane. *Ross* at Abstract. Ross provides no teachings for how such a use of clay can be applied to membrane production according to the method of Minegishi. Therefore, there is no rational underpinning for why one of ordinary skill in the art would apply the clay of Ross to the production of the membrane disclosed in Minegishi. As explained in M.P.E.P. 2142:

**Application No.:** 10/587,786  
**371(c) Date:** July 28, 2006

The Federal Circuit has stated that “rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). *See also KSR*, 550 U.S. at \_\_\_, 82 USPQ2d at 1396 (quoting Federal Circuit statement with approval).

There is no rational basis for asserting that the resin-combined clay of Ross would be suitable for production of membranes using the methods taught by Minegishi. One of ordinary skill would not be capable of applying Ross’ teachings of reinforcing resin products to Minegishi’s teachings of membrane formation. Absent a rational underpinning to combine these teachings, the claims cannot be rendered obvious by Minegishi and Ross.

In view of the above, Applicants respectfully request removal of the obviousness rejection of Claims 5 and 8.

*No Disclaimers or Disavowals*

Although the present communication may include characterizations of claim scope or referenced art, Applicant is not conceding in this application that pending claims are not patentable over the cited references. Rather, any characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

**Application No.:** 10/587,786  
**371(c) Date:** July 28, 2006

### **CONCLUSION**

The present application is believed to be in condition for allowance, and an early action to that effect is respectfully solicited. Applicants invite the Examiner to call the undersigned if any issues may be resolved through a telephonic conversation.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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